

REMARKS

Claims 1-45 are pending in this application. By this Amendment, claim 45 is added.

No new matter is added.

I. Allowable Subject Matter

Applicants appreciate the indication that claims 9-12 contain allowable subject matter. However, for the reasons discussed below, Applicants respectfully submit that all of claims 1-45 are allowable.

II. §103 Rejection over Banon in view of Nashiki

The Office Action rejects claims 1, 16, 17, 37-39, 43 and 44 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,066,880 to Banon (Banon) in view of U.S. Patent No. 6,144,132 to Nashiki (Nashiki). Applicants respectfully traverse the rejection.

A. Claims 1, 16-17, 37 and 38

Claim 1 is directed to a rotary electric machine comprising a stator comprising teeth having a free end deprived of pole swellings and a concentrated winding. As admitted in the Office Action at page 3, Banon fails to teach or suggest the claimed stator comprising teeth having a free end deprived of pole swellings and a concentrated winding.

The Office Action cites Nashiki's disclosure of a stator SCA having teeth S1A-S6A and windings U, V and W to overcome the deficiencies of Banon. See the Office Action at page 3 and Nashiki at column 5, line 59 to column 6, line 4. Specifically, the Office Action states that "it would have been obvious to one skilled in the art at the time the invention was made to use the switched reluctance rotator construction disclosed by Nashiki on the permanent magnet poly-phase synchronous machine disclosed by Banon." However, one skilled in the art would not have been motivated to modify Banon's machine in view of Nashiki's disclosure.

MPEP §§2142 and 2143 require that to establish a *prima facie* case of obviousness, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Furthermore, MPEP §2143.01 states that if the proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. For the reasons discussed below, modifying Banon's machine in view of Nashiki's disclosure would render Banon's machine unsatisfactory for its intended purpose. Accordingly, there is no motivation to make the proposed modification.

In particular, Banon discloses a permanent magnet synchronous electrodynamic machine that includes a stator 2 having semi-closed notches 10, which receive induction coils. See Banon at the Abstract and at column 2, lines 55-58. Accordingly, Banon does not teach or suggest a rotary electric machine comprising a stator comprising a concentrated winding, as claimed in claim 1.

Furthermore, Banon discloses the use of ferrite magnets as opposed to rare-earth magnets. See Banon at column 1, lines 55-64 and column 2, lines 6-10. For this reason, Banon requires a very specific stator that has a high number of teeth. In other words, a specific stator with a high number of teeth is required in order to use the ferrite magnets. For example, in the only two embodiments disclosed, Banon requires 72 teeth. See Banon at column 3, lines 46-47 and 56-57. Moreover, Banon requires that the ratio r_4 defining the number of poles for a given number of stator teeth must be between 0.60 and 0.75. See Banon at column 3, lines 48-58. Thus, Banon's machine is dependent upon the very specific structure of the stator, including a high number of teeth and a ratio r_4 between 0.60 and 0.75.

In contrast to Banon, Nashiki discloses a stator having only 6 teeth, deprived of pole shoes (i.e., pole swellings). See Nashiki at Fig. 1. Furthermore, Nashiki discloses that the

number of pairs of poles P is 4, the number of teeth n is 6, the radial thickness of the stator yoke c is 1.2, and the thickness of the stator tooth e is 1.55 cm. Using the equation disclosed at column 3, line 50 of Banon, Nashiki discloses a ratio r_4 of greater than 2. Accordingly, Nashiki discloses a stator having a low number of teeth, and an r_4 value well outside of the range required by Banon.

As discussed above, Banon requires a stator that has a high number of teeth and that has a ratio r_4 between 0.60 and 0.75. Thus, modifying Banon to include Nashiki's stator would render Banon's machine unsuitable for its intended purpose. Because Nashiki's stator has a low number of teeth and has a ratio r_4 of greater than 2, one skilled in the art would not have been motivated to modify Banon in view of Nashiki.

For at least the reasons discussed above, the Office Action has failed to establish a *prima facie* case of obviousness regarding claim 1. Thus, claim 1 is patentable over Banon, alone or in view of Nashiki. Claims 16-17, 37 and 38 depend from claim 1 and include all of its limitations. Accordingly, these dependent claims are patentable over Banon, alone or in view of Nashiki, for at least the same reasons as claim 1.

B. Claims 39, 43 and 44

Claim 39 is directed to a rotary electric machine comprising a stator comprising teeth having an end connected to said annular portion, each tooth comprising two non-parallel opposite planar faces, and a concentrated winding. Banon does not teach or suggest the claimed stator comprising teeth having an end connected to said annular portion, each tooth comprising two non-parallel opposite planar faces.

As illustrated in Fig. 2, Banon discloses that the thickness of consecutive teeth 16 between two notches 10 is the constant e . See column 3, lines 40-41. As clearly illustrated in Fig. 2, and in contrast to claim 39, Banon discloses teeth having parallel opposite planar

faces. Thus, Banon clearly does not teach the claimed stator comprising teeth...each tooth comprising two non-parallel opposite planar faces.

As discussed above, the Office Action cites Nashiki's stator to overcome the deficiencies of Banon. However, as discussed above, modifying Banon to include Nashiki's stator would render Banon's machine unsuitable for its intended purpose. Banon requires a stator that has a high number of teeth and that has a ratio r_4 between 0.60 and 0.75, whereas Nashiki's stator has a low number of teeth and has a ratio r_4 of greater than 2. Thus, one skilled in the art would not have been motivated to modify Banon in view of Nashiki.

For at least these reasons, the Office Action has failed to establish a *prima facie* case of obviousness regarding claim 39. Thus, claim 39 is patentable over Banon, alone or in view of Nashiki. Claims 43 and 44 depend from claim 39 and include all of its limitations. Accordingly, these dependent claims are patentable over Banon, alone or in view of Nashiki, for at least the same reasons as claim 39.

C. Conclusion

For at least the reasons discussed above, claims 1, 16-17, 37-39, 43 and 44 are patentable over Banon, alone or in view of Nashiki. Reconsideration and withdrawal of the rejection are respectfully requested.

III. §103 Rejection over Banon in view of Nashiki and further in view of Abukawa

The Office Action rejects claims 2, 3, 15, 18 and 35 under 35 U.S.C. §103(a) as being unpatentable over Banon in view of Nashiki and further in view of U.S. Patent No. 6,335,582 to Abukawa et al. (Abukawa). Applicants respectfully traverse the rejection.

Claim 1, Banon and Nashiki are discussed above. As discussed above, Banon fails to teach or suggest the claimed stator comprising teeth having a free end deprived of pole swellings and a concentrated winding.

Abukawa is cited for disclosing a permanent magnet rotating machine with large motor torque and high generating voltage in Figs. 2, 3 and 6. Specifically, the Office Action states that it would have been obvious to modify Nashiki's stator in view of Abukawa's disclosure. However, as discussed above, one skilled in the art would not have been motivated to modify Banon's machine in view of Nashiki's disclosure--regardless of whether one skilled in the art would have been motivated to modify Nashiki's stator in view of Abukawa's disclosure. Furthermore, Abukawa fails to overcome the deficiencies of Banon, because Abukawa fails to teach or suggest the claimed stator comprising teeth having a free end deprived of pole swellings and a concentrated winding.

For at least these reasons, the Office Action has failed to establish a *prima facie* case of obviousness regarding claim 1. Thus, claim 1 is patentable over Banon, alone or in view of Nashiki and further in view of Abukawa. Claims 2, 3, 15, 18 and 35 depend from claim 1 and include all of its limitations. Accordingly, these dependent claims are patentable over Banon, alone or in view of Nashiki and further in view of Abukawa, for at least the same reasons as claim 1. Reconsideration and withdrawal of the rejection are respectfully requested.

IV. §103 Rejection over Banon in view of Nashiki and further in view of Yates

The Office Action rejects claims 4-8, 13, 14, 30 and 32-34 under 35 U.S.C. §103(a) as being unpatentable over Banon in view of Nashiki and further in view of U.S. Patent No. 4,618,792 to Yates (Yates). Applicants respectfully traverse the rejection.

Claim 1, Banon and Nashiki are discussed above. As discussed above, Banon fails to teach or suggest the claimed stator comprising teeth having a free end deprived of pole swellings and a concentrated winding.

Yates is cited for disclosing a magnetic rotor in Fig. 1. Specifically, the Office Action states that it would have been obvious to modify Banon's rotor in view of Yate's disclosure, in

addition to modifying Banon's stator in view of Nashiki's stator. However, as discussed above, one skilled in the art would not have been motivated to modify Banon's machine in view of Nashiki's disclosure--regardless of whether one skilled in the art would have been motivated to modify Banon's rotor in view of Yate's disclosure. Furthermore, Yates fails to overcome the deficiencies of Banon, because Yates fails to teach or suggest the claimed stator comprising teeth having a free end deprived of pole swellings and a concentrated winding.

For at least these reasons, the Office Action has failed to establish a *prima facie* case of obviousness regarding claim 1. Thus, claim 1 is patentable over Banon, alone or in view of Nashiki and further in view of Yates. Claims 4-8, 13, 14, 30 and 32-34 depend from claim 1 and include all of its limitations. Accordingly, these dependent claims are patentable over Banon, alone or in view of Nashiki and further in view of Yates, for at least the same reasons as claim 1. Reconsideration and withdrawal of the rejection are respectfully requested.

V. §103 Rejection over Banon in view of Nashiki and further in view of Shibano

The Office Action rejects claims 19-21 and 41 under 35 U.S.C. §103(a) as being unpatentable over Banon in view of Nashiki and further in view of U.S. Patent No. 3,870,982 to Shibano et al. (Shibano). Applicants respectfully traverse the rejection.

A. Claims 19-21

Claim 1, Banon and Nashiki are discussed above. As discussed above, Banon fails to teach or suggest the claimed stator comprising teeth having a free end deprived of pole swellings and a concentrated winding.

Shibano is cited for disclosing an impregnated electromagnetic coil. Specifically, the Office Action states that it would have been obvious to modify Banon's stator in view of Shibano's disclosure, in addition to modifying Banon's stator in view of Nashiki's stator. However, as discussed above, one skilled in the art would not have been motivated to modify

Banon's machine in view of Nashiki's disclosure--regardless of whether one skilled in the art would have been motivated to modify Banon's stator in view of Shibano's disclosure.

Furthermore, Shibano fails to overcome the deficiencies of Banon, because Shibano fails to teach or suggest the claimed stator comprising teeth having a free end deprived of pole swellings and a concentrated winding.

For at least these reasons, the Office Action has failed to establish a *prima facie* case of obviousness regarding claim 1. Thus, claim 1 is patentable over Banon, alone or in view of Nashiki and further in view of Shibano. Claims 19-21 depend from claim 1 and include all of its limitations. Accordingly, these dependent claims are patentable over Banon, alone or in view of Nashiki and further in view of Shibano, for at least the same reasons as claim 1.

B. Claim 41

Claim 41 is directed to a rotary electric machine comprising a stator comprising a concentrated winding, said concentrated winding comprising at least one individual coil comprising a plurality of superposed turns of a substantially flat bundle of insulated wires wound around a winding axis, in such a manner that a cross-section of the bundle has a long dimension that extends substantially perpendicularly to the winding axis. As admitted in the Office Action at page 7, Banon, alone or in view of Nashiki fails to teach or suggest the claimed at least one individual coil comprising a plurality of superposed turns of a substantially flat bundle of insulated wires wound around a winding axis.

Shibano is cited for disclosing an impregnated electromagnetic coil. However, Shibano discloses an elementary electromagnetic coil comprising a single wire. See column 1, lines 48-49. Thus, Shibano clearly does not teach or suggest the claimed at least one individual coil comprising a plurality of superposed turns of a substantially flat bundle of insulated wires wound around a winding axis, as required by claim 41. Thus, Shibano fails to overcome the deficiencies of Banon and Nashiki.

Moreover, as discussed above, one skilled in the art would not have been motivated to modify Banon's machine in view of Nashiki's disclosure--regardless of whether one skilled in the art would have been motivated to modify Banon's stator in view of Shibano's disclosure. Furthermore, Shibano fails to overcome the deficiencies of Banon, because Shibano fails to teach or suggest the claimed at least one individual coil comprising a plurality of superposed turns of a substantially flat bundle of insulated wires wound around a winding axis.

For at least these reasons, the Office Action has failed to establish a *prima facie* case of obviousness regarding claim 41. Thus, claim 41 is patentable over Banon, alone or in view of Nashiki and further in view of Shibano.

C. Conclusion

For at least the reasons discussed above, claims 19-21 and 41 are patentable over Banon, alone or in view of Nashiki and further in view of Shibano. Reconsideration and withdrawal of the rejection are respectfully requested.

VI. §103 Rejection over Banon in view of Nashiki, further in view of Shibano and further in view of Abukawa

The Office Action rejects claims 22-25 under 35 U.S.C. §103(a) as being unpatentable over Banon in view of Nashiki, further in view of Shibano and further in view of Abukawa. Applicants respectfully traverse the rejection.

Claim 1, Banon, Nashiki, Shibano and Abukawa are discussed above. For the reasons discussed above, one skilled in the art would not have been motivated to modify Banon's machine in view of Nashiki's disclosure. Furthermore, for the reasons discussed above, each of Banon, Shibano and Abukawa fails to teach or suggest the claimed stator comprising teeth having a free end deprived of pole swellings and a concentrated winding. Accordingly, claim 1 is patentable over Banon, alone or in view of Nashiki, further in view of Shibano and further in view of Abukawa.

Claims 22-25 depend from claim 1 and include all of its limitations. Accordingly, these dependent claims are patentable over Banon, alone or in view of Nashiki, further in view of Shibano and further in view of Abukawa, for at least the same reasons as claim 1. Reconsideration and withdrawal of the rejection are respectfully requested.

VII. §103 Rejection over Banon in view of Nashiki and further in view of Guers

The Office Action rejects claims 26-29, 40 and 42 under 35 U.S.C. §103(a) as being unpatentable over Banon in view of Nashiki and further in view of U.S. Patent No. 4,688,951 to Guers. Applicants respectfully traverse the rejection.

A. Claims 26-29

Claim 1, Banon and Nashiki are discussed above. As discussed above, Banon fails to teach or suggest the claimed stator comprising teeth having a free end deprived of pole swellings and a concentrated winding.

Guers discloses a device for performing a transmission of electric signals of a roller bearing, without the relative angular movements of the elements of the roller bearing disturbing the accuracy of the transmission. See Guers at column 1, lines 32-35 and 46-50. Guers is cited for disclosing contactless transmission of electric signals between the roller bearing and the electric circuits at claims 8 and 23. Specifically, the Office Action states that it would have been obvious to modify Nashiki's machine in view of Guer's disclosure, in addition to modifying Nashiki's machine in view of Abukawa's and Yates' disclosures, and also in addition to modifying Banon's machine in view of Nashiki's, Abukawa's, Yates' and Guer's disclosures.

However, as discussed above, one skilled in the art would not have been motivated to modify Banon's machine in view of Nashiki's disclosure--regardless of whether one skilled in the art would have been motivated to modify Nashiki's machine in view of Abukawa's, Yates' and Guer's disclosures. Furthermore, Guer fails to overcome the deficiencies of Banon,

because Guer fails to teach or suggest the claimed stator comprising teeth having a free end deprived of pole swellings and a concentrated winding.

For at least these reasons, the Office Action has failed to establish a *prima facie* case of obviousness regarding claim 1. Thus, claim 1 is patentable over Banon, alone or in view of Nashiki and further in view of Guer. Claims 26-29 depend from claim 1 and include all of its limitations. Accordingly, these dependent claims are patentable over Banon, alone or in view of Nashiki and further in view of Guer, for at least the same reasons as claim 1.

B. Claims 40 and 42

Claim 40 is directed to a rotary electric machine comprising a stator comprising at least one detector comprising a magnetic field sensor to detect a magnetic field of the magnets of the rotor from a location that overlaps a peripheral region of the rotor when the machine is observed on an axis of rotation of the rotor. Banon fails to teach or suggest the claimed stator comprising at least one detector comprising a magnetic field sensor to detect a magnetic field of the magnets of the rotor from a location that overlaps a peripheral region of the rotor when the machine is observed on an axis of rotation of the rotor.

Claim 42 is directed to a rotary electric machine comprising a stator comprising a concentrated winding, said concentrated winding comprising at least one coil defining with a corresponding tooth a gap, a detector for delivering a signal representative of rotation of a the rotor being engaged in said gap. As acknowledged in the Office Action at page 9, Banon, alone or in view of Nashiki fails to teach or suggest the claimed stator comprising a concentrated winding, said concentrated winding comprising at least one coil defining with a corresponding tooth a gap, a detector for delivering a signal representative of rotation of a the rotor being engaged in said gap.

Banon, Nashiki, Abukawa, Yates and Guers are discussed above. As discussed above, one skilled in the art would not have been motivated to modify Banon's machine in view of

Nashiki's disclosure--regardless of whether one skilled in the art would have been motivated to modify Nashiki's machine in view of Abukawa's, Yates' and Guer's disclosures.

Furthermore, Guer fails to overcome the deficiencies of Banon, because Guer fails to teach or suggest the claimed stator comprising a concentrated winding, said concentrated winding comprising at least one coil defining with a corresponding tooth a gap, a detector for delivering a signal representative of rotation of a the rotor being engaged in said gap.

For at least these reasons, the Office Action has failed to establish a *prima facie* case of obviousness regarding claim 42. Thus, claim 42 is patentable over Banon, alone or in view of Nashiki and further in view of Guer.

C. Conclusion

For at least the reasons discussed above, claims 26-29, 40 and 42 are patentable over Banon, alone or in view of Nashiki and further in view of Guer. Reconsideration and withdrawal of the rejection are respectfully requested.

VIII. §103 Rejections over Banon in view of Nashiki and further in view of Curtis or Noodleman

The Office Action rejects claim 31 under 35 U.S.C. §103(a) as being unpatentable over Banon in view of Nashiki and further in view of U.S. Patent No. 4,896,839 to Curtis Jr. et al. (Curtis). In addition, the Office Action rejects claim 36 under 35 U.S.C. §103(a) as being unpatentable over Banon in view of Nashiki and further in view of U.S. Patent No. 3,979,821 to Noodleman (Noodleman). Applicants respectfully traverse the rejections.

Claim 1, Banon and Nashiki are discussed above. As discussed above, Banon fails to teach or suggest the claimed stator comprising teeth having a free end deprived of pole swellings and a concentrated winding.

Curtis is cited for disclosing connection ends that are soldered to locally stripped portions of sheathed electric cables. Noodleman is cited for disclosing the manufacture of a rare earth permanent magnet rotor that includes an aluminum central portion. However, as discussed above, one skilled in the art would not have been motivated to modify Banon's machine in view of Nashiki's disclosure--regardless of whether one skilled in the art would have been motivated to modify Banon's machine in view of Curtis' or Noodleman's disclosures. Furthermore, each of Curtis and Noodleman fails to overcome the deficiencies of Banon, because each of Curtis and Noodleman fails to teach or suggest the claimed stator comprising teeth having a free end deprived of pole swellings and a concentrated winding.

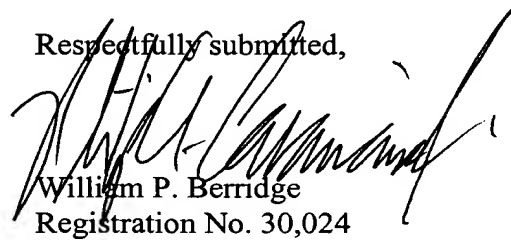
For at least these reasons, the Office Action has failed to establish a *prima facie* case of obviousness regarding claim 1. Thus, claim 1 is patentable over Banon, alone or in view of Nashiki and further in view of Curtis or Noodleman. Claims 31 and 36 depend from claim 1 and include all of its limitations. Accordingly, claim 31 is patentable over Banon, alone or in view of Nashiki and further in view of Curtis, and claim 36 is patentable over Banon, alone or in view of Nashiki and further in view of Noodleman, for at least the same reasons as claim 1. Reconsideration and withdrawal of the rejection are respectfully requested.

IX. Conclusion

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of claims 1-45 are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,



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